REMARKS

This amendment is responsive to the Office Action dated August 25, 2005. Applicant has amended claims 1, 5, 28, 29, 31, 32, 34, 36, 37, 44, 55 and 65, and cancelled claim 40. Claims 1-39 and 41-69 are pending.

Claim Rejection Under 35 U.S.C. § 112

In the Office Action, the Examiner rejected claims 28 and 65 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claims 28 and 65 for purposes of clarification. Applicant submits that claims, as amended, particularly point out and distinctly claim the subject matter, as required by 35 U.S.C. 112, second paragraph.

Claim Rejection Under 35 U.S.C. §§ 102 & 103

Claims 1-39 and 41-69

In the Office Action, the Examiner rejected claim 1 under 35 U.S.C. 102(b) as being anticipated by Lemchen (US 5,011,405). In addition, the Examiner rejected claims 2-18, 26-28 and 44-48 under 35 U.S.C. 103(a) as being unpatentable over Lemchen in view of Taub (US 6,739,869), rejected claims 19-36 under 35 U.S.C. 103(a) as being unpatentable over Taub in view of Mortenson (Mortenson, Michael E.; "Geometric Modeling", 1985, John Wiley & Sons), rejected claims 37-42 under 35 U.S.C. 103(a) as being unpatentable over Taub in view of Lemchen, and rejected claim 43 under 35 U.S.C. 103(a) as being unpatentable over Taub in view of Lemchen in view of Mortenson. Applicant respectfully traverses the rejection to the extent such rejection may be considered applicable to the amended claims.

With respect to amended independent claim 1, Lemchen fails to disclose each and every feature of the claimed invention, as required by 35 U.S.C. 102(b), and provides no teaching that would have suggested the desirability of modification to include such features. Applicant's claim 1 as amended is directed to a computer-implemented method that requires *presenting a user interface* to receive from a user prescription data representative of *user-specified* desired final positions for one or more teeth of the defined three-dimensional malocclued tooth/arch model. Applicants have amended claim 1 to clarify that the claimed computer-implemented

method allows an orthodontic user to specify the desired final positions for the teeth in reference to a 3D model by interacting with the user interface.

In addition, claim 1 as amended requires that the computer-implemented method require *executing bracket selection software for selecting* predefined and *existing* orthodontic brackets for use in moving the teeth of the 3D model to the *user-specified* desired final positions. That is, the computer-implemented method of claim 1 executes software that selects one or more predefined and existing brackets based on user-specified desired final positions.

In contrast, Lemchen describes computer-implemented techniques for designing and manufacturing *custom orthodontic appliances* based on the anatomy of the individual patient. In other words, Lemchen describes techniques for forming custom appliances that are tailored to the individual anatomy of the patient. As discussed in the Background of the present application, such techniques for designing and manufacturing customized orthodontic products from exact replicas of a patient's teeth and tailored to an individual may be a complex and costly process.[1]

According to Lemchen, "straight-wire" orthodontic systems existing at the time of filing were manufactured to conform to malocclusion characteristics of population averages.[2] Lemchen states that, for this reason, there was no individual adaptability in any given prior art system, and a patient's specific pretreatment malocclusion, dental surface morphology, and facial type were completely disregarded.[3] According to Lemchen, the orthodontic method described therein provides a "significant advancement" over these orthodontic practices by utilizing parameters that are *individualized* to the patient.[4]

Indeed, Lemchen describes generating digital information that defines the shape and location of the malocclused tooth with respect to the patient's jaw,[5] and generation of a mathematical model of the tooth and jaw from the digital information.[6] However, Lemchen

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[1] Present application at pg. 3, ln. 29 – pg. 4, ln. 2; See also Background stating "In providing such customization, generally, exact patient models typically derived from digitized information of anatomical shapes of the patient's mouth are used. For example, an orthodontic bracket may be automatically designed from the digitized tooth shape information and then provided using numerical controlled manufacturing technology. For example, the digitized information may be generated from measurements of the mouth of the patient, either taken directly or from a model thereof, and may include information associated with the shape of the individual teeth of the patient and/or of the patient's arches."
[2] *Col. 1, ll. 38-41.*
[3] *Col. 1, ll. 41-43.*
[4] *Col. 1, ll. 47-52.*
[5] *Col. 2, ll. 54-60.*
[6] *Abstract.*

makes clear that the software programs *calculate* a desired position for each tooth after treatment (referred to as a "finish position" or a "post-treatment position) from the mathematical model.[7] According to Lemchen, repositioning of the teeth is computed mathematically by appropriate software programs.[8] Lemchen emphasizes that the software programs compute an "ideal" finish position for each tooth that is not based upon statistical averages, but rather takes into account the variation and physical characteristics of the individual patient. The software programs of Lemchen provide "customized" finish positions for the particular patient so as to make the finished positions ideal for the patient, rather than attempting to duplicate the statistical average finished position.[9]

Once the bracket positions are calculated, brackets are modified to create custom brackets, to provide for tooth movement to the finish positions that have been computed for the individual patient.[10] In particular, the computerized method described by Lemchen utilizes modification of the angulation of the bracket/tooth interface on an individualized basis in order to cause the bracket to produce a desired force vector on the tooth.[11]

Thus, unlike claim 1, Lemchen fails to teach or suggest a computer-implemented method of orthodontic appliance selection that requires presenting a user interface to receive from a user prescription data representative of *user-specified desired final positions* for one or more teeth of the defined three-dimensional malocclused tooth/arch model. To the contrary, the Lemchen system actually calculates "ideal" finish positions from the mathematical model and provides no mechanism by which a user specifies desired final positions.

Secondly, Lemchen fails to teach or suggest executing bracket selection software for selection of predefined and existing orthodontic brackets for use in moving one or more teeth to the user-specified desired final positions. Lemchen states that brackets are customized, and provides no teaching of a computer-implemented process that facilitates selection of the existing brackets based on prescription data. For at least these reasons, Lemchen fails to teach or suggest a method that assists in automated fashion the selection of existing brackets based on user-specified final tooth position.

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[7] *Col. 1, ll. 60-61.*
[8] *Col. 3, ll. 33-46.*
[9] *Col. 3, ll. 46-54.*
[10] *Col. 2, ll. 13-15.*

Moreover, neither Taub nor any of the other cited references overcome the deficiencies of Lemchen. Like Lemchen, Taub fails to describe any software process that facilitates the selection of orthodontic brackets from predefined and existing orthodontic brackets based on user-specified prescription data. In contrast, in Taub, the user is left to select orthodontic brackets without any computer-implemented assistance. In other words, Taub does not teach or suggest any computer-implemented process that selects brackets based on prescription data provided by a user.

For example, Taub merely states that "[i]n a typical yet not exclusive sequence of operation in virtual treatment, the **user** first selects brackets and places them at appropriate positions on the surface of selected teeth..."[12] Later, Taub states that "[t]he user can select the brackets from a library of brackets, and similarly can select wires, bands etc. from corresponding libraries."[13] None of this provides any teaching of a computer-implemented process that selects brackets based on user-supplied prescription data. No computer-implemented process for searching and selecting brackets based on any criteria is described. Rather, as clearly stated by Taub, the user is left to select the brackets in an un-assisted manner. Thus, Taub also fails to teach or suggest a computer-implemented method of orthodontic appliance selection where bracket selection software is executed to select one or more existing orthodontic brackets based on prescription data provided by the user.

The fact that Taub fails to teach or suggest a computer-implemented process for selection brackets based on user-supplied prescription data is clearly evidenced by the order in which the steps are performed in the Taub process. For example, Taub states that typically the user **first** selects brackets and places them on the teeth. **Second**, the user specifies the prescription for the patient's dental arch, e.g, defines the final position of the teeth and the distances between the teeth.[14] Thus, in Taub the user selects brackets even **before** specifying any desired final

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[11] *Col. 4, ll. 33-35.*
[12] Taub at col. 6, ll. 30-32.
[13] Taub at col. 7, ll. 19-25.
[14] Taub at col. 6, ll. 29-52 (stating "In a typical yet not exclusive sequence of operation in virtual treatment, the user first selects brackets and places them at appropriate positions on the surface of selected teeth, usually all teeth of the jaw. ...At a next step, the user may define the final desired distance between the teeth (the default is usually zero) and then selects an arch-wire from a library of such wires. ...Thereafter, the wire may be associated with the teeth model, [and the] effect of the components on each tooth is thereafter computed by the system, based on the set of rules to determine the outcome of the virtual treatment.") (emphasis added).

positions for one or more teeth. Further, only after this entire process is prescription data generated in Taub.[15]

Consequently, in Taub, no form of prescription data representative of user-specified final positions can be used in a bracket selection process to assist the selection of brackets, as required by claim 1. On matter, the Taub reference is quite the opposite from claim 1 in that, in Taub, the user first selects the bracket in an unassisted manner prior to even specifying the desired final tooth positions.

With respect to independent claim 29, as amended, Lemchen in view of the other cited references fails to teach or suggest executing bracket selection software for selecting one or more of a plurality of predefined orthodontic brackets for use in moving one or more of the teeth to user-specified desired final positions. As outlined above, Lemchen describe manufacturing customized brackets and Taub describes a user selecting a bracket in an unassisted manner prior to specifying final positions for the teeth.

Similarly, with respect to independent claim 37, Lemchen in view of the other cited references fails to teach or suggest means for executing a computer-implemented bracket selection process for selection of one or more of a plurality of predefined and existing orthodontic brackets that move the one or more teeth of the defined three-dimensional maloccluded tooth/arch model at least close to, but not necessarily exactly to, the user-defined desired final positions represented by the prescription data.

With respect to independent claim 44, Lemchen in view of the other cited references fails to teach or suggest providing a user interface for allowing a user to define a three-dimensional maloccluded tooth/arch model as a function of patient information; and providing a user interface for allowing a user to define prescription data representative of desired final tooth positions for one or more teeth of the defined three-dimensional maloccluded tooth/arch model, and executing bracket selection software for selecting one or more of the plurality of predefined and existing orthodontic brackets from a database for use in moving one or more teeth of the defined three-dimensional maloccluded tooth/arch model to the desired final positions based on at least the prescription data. The references fail to teach or suggest selection of brackets based on user-specified final tooth positions of a tooth/arch model.

[15] Taub at col. 6, ll. 53-62.

Further, dependent claim 49 requires overlaying the representation of the desired final tooth positions for one or more teeth of the defined three-dimensional malocclucled tooth/arch model and the representation of one or more teeth of the defined three-dimensional malocclucled tooth/arch model in positions based on bracket data; and modifying the selection of one or more of the plurality of predefined and existing orthodontic brackets from a database based on the overlaid representations. In this manner, the method required by dependent claim 49 requires overlaying two different types of representations of the dental arch: (1) the representations of the *desired* final tooth position, and (2) representations of the arch *repositioned* based on the selected brackets. This provides a user a visual aid to determine any difference between the desired final positions and the repositioned final positions based on the pre-defined brackets that were selected using the user-supplied prescription data. Neither Lemchen nor Taub provide any teaching or suggestion of any such feature.

With respect to independent claim 55, Lemchen in view of the other cited references fails to teach or suggest providing prescription data representative of user-specified desired final positions for one or more teeth of the defined malocclucled tooth/arch model, and executing bracket selection software for selecting one or more of the plurality of predefined and existing orthodontic brackets for use in moving one or more teeth of the defined three-dimensional malocclucled tooth/arch model to the desired final positions based on at least the prescription data.

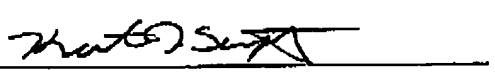
For at least these reasons, Applicant submits that the cited references, either singularly or in combination, fail to establish a prima facie case for anticipation or obviousness of Applicant's claims 1-39 and 41-69. Withdrawal of this rejection is requested.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:
February 24, 2006

By:



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